Alg. 2 Warm Up #11-2

1. $\sin\theta = \frac{3}{5}$, find $\cos\theta$ using the pythagorean identity. (see page 343 if you don't remember)

2. Write the equation for the circle in standard form and state the center and radius. (No decimals!)

$x^2 + y^2 - 10x + y - 5 = 0$

HW Questions:

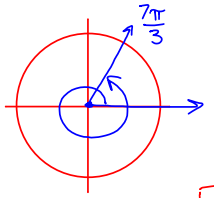
Review & Preview

7-104. What central angle, measured in degrees, corresponds to a distance around the unit circle of $\frac{7\pi}{3}$?

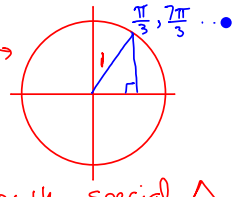
a. What other angles will take you to the same point on the circle? $\frac{\pi}{3}, -300°, \ldots$

b. Make a sketch of the unit circle showing the resulting right triangle.

c. Find $\sin\left(\frac{7\pi}{3}\right)$, $\cos\left(\frac{7\pi}{3}\right)$, and $\tan\left(\frac{7\pi}{3}\right)$ exactly.

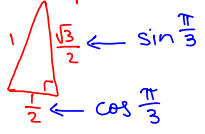


TOA, look at the Δ →



c) $\sin\frac{7\pi}{3} = \sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}$

from the special Δ



$\frac{\frac{\sqrt{3}}{2}}{\frac{2}{1}}$

$\tan\frac{7\pi}{3} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}}$

$= \frac{\sqrt{3}}{2} \cdot \frac{2}{1}$

$= \sqrt{3}$

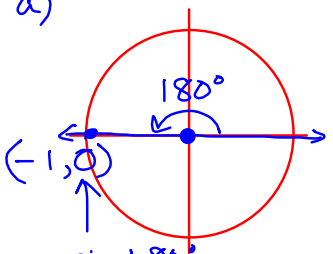
$(x, y) \rightarrow (\cos\theta, \sin\theta)$

7-105. Evaluate each of the following trig expressions without using a calculator.

a. sin(180°) b. sin(360°) c. sin(–90°)

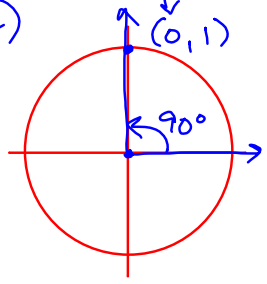
d. sin(510°) e. cos(90°) f. tan(–90°)

a)

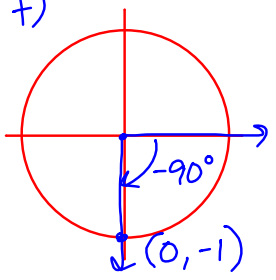


$\sin 180° = 0$

e) $= 0$



f) $= \frac{\sin(-90°)}{\cos(-90°)} \quad \frac{y}{x}$



$\tan(-90°) = \frac{-1}{0}$

undefined.

7-106. How do you convert from degrees to radians and from radians to degrees? Explain and justify your method completely. Add some examples to your Toolkit.

π radians $= 180°$

degrees to radians

$\frac{45°}{1} \cdot \frac{\pi \text{ rad}}{180°} = \frac{\pi \text{ rad}}{4}$

7-107. Convert each of the following angle measures. Give exact answers.

a. $\frac{7\pi}{6}$ radians to degrees b. $\frac{5\pi}{3}$ radians to degrees

c. 45 degrees to radians d. 100° to radians

e. 810° to radians f. $\frac{7\pi}{2}$ radians to degrees

$\frac{5\pi}{3}$ radians $\cdot \frac{60°}{\pi \text{ rad}} = 300°$

7-108. Sketch a graph of $f(x)=\frac{1}{2}(x+1)^3$. Then sketch its inverse and write the equation of the inverse.

left 1 vertical compression by $\frac{1}{2}$

7-109. Rewrite $f(x)=2x^2-16x+34$ in graphing form.

$f(x)=2(x^2-8x+16)+34-32$

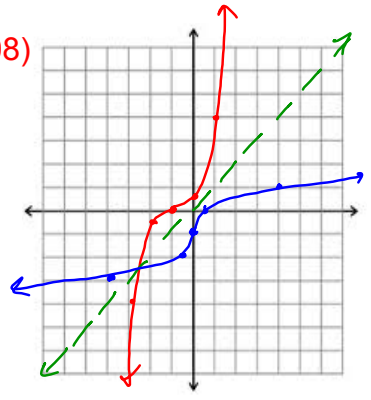
$f(x)=2(x-4)^2+2$

x	f(x)
-3	-4
-2	-½
-1	0
0	½
1	4

inverse

x	y
-4	-3
-½	-2
0	-1
½	0
4	1

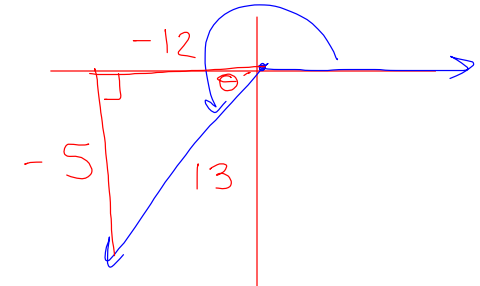
108)



7-110. For angle θ in the third quadrant, $\cos\theta=-\frac{12}{13}$. Use this information to find each of the following values without using a calculator.

a. $\sin\theta = -\frac{5}{13}$

b. $\tan\theta = \frac{-5}{-12} = \frac{5}{12}$



$y^2+(-12)^2=13^2$

$y=$

$\tan\theta=\frac{\sin\theta}{\cos\theta}$

$=\frac{-\frac{5}{13}}{-\frac{12}{13}}$

$=\frac{5}{12}$

Given that $\log_x 2 = a$, $\log_x 5 = b$, and $\log_x 7 = c$, write expressions using a, b, and/or c for each log expression below.

a. $\log_x 10$ b. $\log_x 49$ c. $\log_x 50$ d. $\log_x 56$

$\log_x 2 \cdot 5^2 = \log_x 2 + \log_x 5^2$

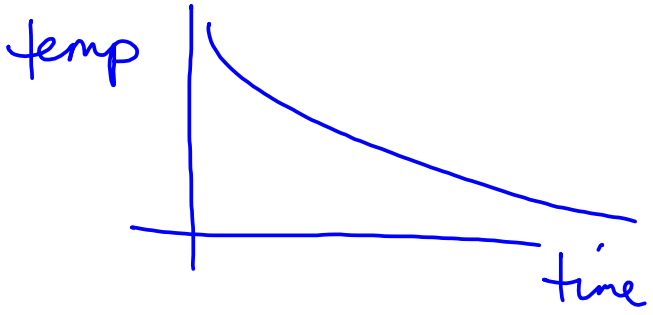
$\log_x 2 + 2\log_x 5$

$a + 2b$

The temperature of a pizza after it has been delivered depends on how long it has been sitting on the family-room table.

a. Sketch a reasonable graph of this situation. Be sure to label the axes.

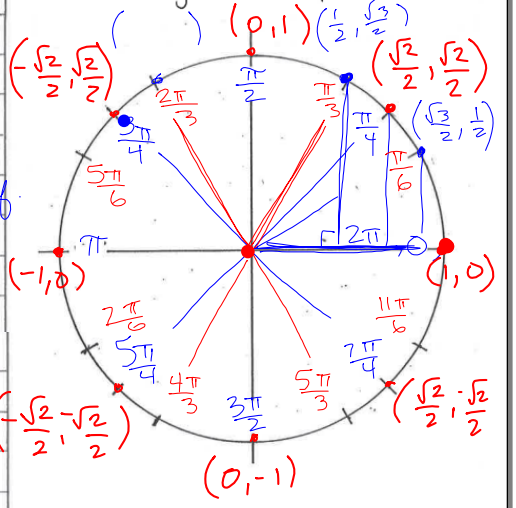
b. Should your graph have an asymptote? Why or why not?



7-101 a) Complete the table: (Use special Δ's and Unit Circle)

Radians θ	Exact cos θ (x)	Exact sin θ (y)	Exact tan θ (y/x)	Approx tan θ
0	1	0	$\frac{0}{1}=0$	0
$\frac{\pi}{6}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{3}}$	0.58
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	1
$\frac{\pi}{3}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$	1.73
$\frac{\pi}{2}$	0	1	undef	undef
$\frac{2\pi}{3}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\sqrt{3}$	-1.73
$\frac{3\pi}{4}$				
$\frac{5\pi}{6}$				
π				
$\frac{3\pi}{2}$				
2π				

Draw Δ's on the unit circle below to figure out slopes (tan θ)



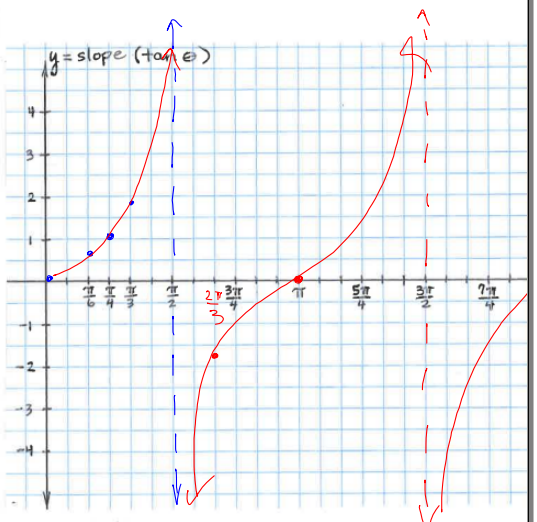
Two ways to calculate $\tan(\frac{\pi}{6})$

① → $1 \div \sqrt{3}$

② → $\tan(\pi \div 6)$

* in radian mode

Radians θ	Exact sin θ	Exact cos θ	Exact tan θ	Approx. tan θ
0				0
$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$	0.58
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$			1
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$			1.73
$\frac{\pi}{2}$				undef.
$\frac{2\pi}{3}$				-1.73
$\frac{3\pi}{4}$				-1
$\frac{5\pi}{6}$				-0.58
π				0
$\frac{7\pi}{6}$				
$\frac{5\pi}{4}$				
$\frac{4\pi}{3}$				
$\frac{3\pi}{2}$				
$\frac{5\pi}{3}$				
$\frac{7\pi}{4}$				
2π				

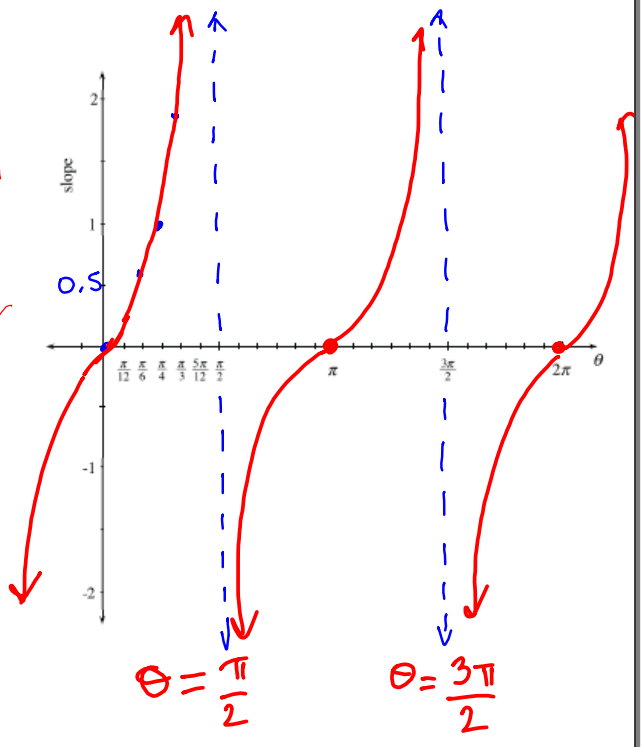


Domain

$\theta \neq \frac{\pi}{2} + \pi n$

let n = integer

$(\pi n, 0)$



Lesson 7.1.7 Resou

7-102. Investigate the tangent graph by analyzing the following questions:

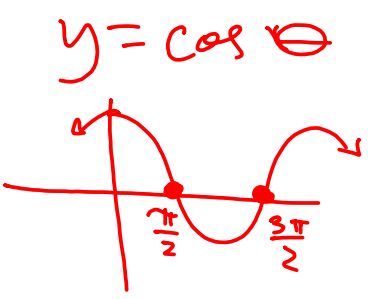
a. Describe the domain and range of the tangent function.

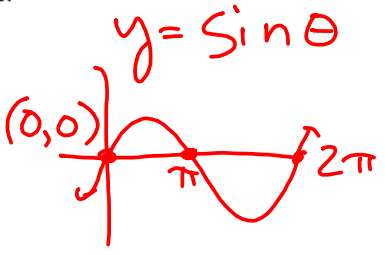
b. Describe any special points or asymptotes.

c. Does it have symmetry? Describe any symmetry you see in the graph.

d. How is the graph of $t(\theta) = \tan\theta$ different from the graphs of $s(\theta) = \sin\theta$ and $c(\theta) = \cos\theta$?

Further Guidance section ends here.



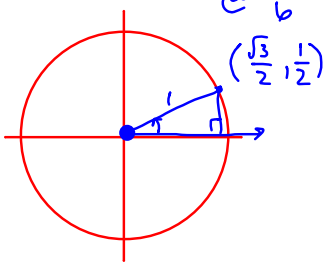


7-103. Draw a new unit circle and label a point that corresponds to a rotation of $\frac{\pi}{6}$ radians.

a. What are the coordinates of this point? Use exact values.

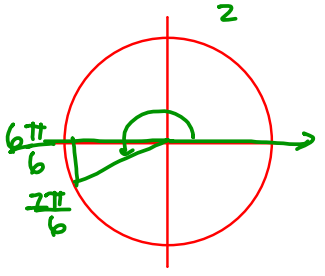
b. Use this information to find each of the following values without a calculator. (Hint: Drawing each angle on the unit circle will be very helpful.)

i: $\tan\left(\frac{7\pi}{6}\right)$ *ii*: $\cos\left(\frac{13\pi}{6}\right)$ *iii*: $\tan\left(\frac{2\pi}{3}\right)$



i) $\tan = \frac{\sin}{\cos}$ $\frac{y}{x}$

$\tan\frac{7\pi}{6} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$



HW: Checkpoint 7A, # 1 - 9

Checkpoint 7B, # 1 - 9

Copy original problem first, then show work to support your answers.